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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/705,906	11/13/2003	Randolph G. Nichols	H000444	7319

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EXAMINER	
HOFFBERG, ROBERT JOSEPH	
ART UNIT	**PAPER NUMBER**
2835	

DATE MAILED: 11/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/705,906	NICHOLS, RANDOLPH G.	
	Examiner	Art Unit	
	Robert J. Hoffberg	2835	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 November 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/13/04, 5/17/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Detailed Action

Specification

1. The disclosure is objected to because of the following informalities: Para 0018, line 9, "25" should be "215".

Appropriate correction is required.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: Fig. 2A, #217. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 7 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Artus (US 4,764,845).

With respect to Claim 7, Artus teaches an apparatus for providing rigidity to a circuit card assembly, wherein the circuit card assembly comprises a printed wiring board (Fig. 2, #11) and electronic components (Fig. 2, #13) mounted thereon, the apparatus comprising: a shell (Fig. 2, #1) comprised of thin lightweight planar sheets (Fig. 2, #4) for covering the printed wiring board and electronic components mounted thereon, wherein the planner sheets are spaced from each other via at least one of a spacer (Fig. 2, #18) and a connector (Fig. 2, #2 and #6) for electrically connecting the printed wiring board and electronic components mounted thereon with an external circuit (Col. 1, line 33); a thermal filler (Fig. 2, #19) disposed in a region between the shell and at least one of the electronic components; and a lightweight material (Fig. 2, #8, #9 or #15) substantially filling any remaining voids between the shell and the printed wiring board and electronic components.

With respect to Claim 11, Artus teaches a method of manufacturing a circuit card assembly, comprising: mounting electronic components (Fig. 2, #13) on a printed wiring board (Fig. 2, #11), wherein the printed wiring board comprises a connector (Fig. 2, #2 and #6) for electrically connecting the printed wiring board with an external electrical circuit (Col. 1, line 33); placing the printed wiring board with the electronic components into a shell (Fig. 2, #1) made of a lightweight material, wherein the connector extends outwardly from the shell (see Fig. 2); injecting a thermal filler (Fig. 2, #19) into the shell

in a region substantially between the shell and at least one electronic component; and injecting a lightweight filling material (Col. 4, line 57) to substantially fill any remaining voids in the shell.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 4, 6, 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Artus (US 4,764,845) in view of Bootle (US 5,717,160).

With respect to Claims 1 and 6, Artus teaches a circuit card assembly, comprising: a printed wiring board (Fig. 2, #11) with electronic components (Fig. 2, #13) mounted thereto; a shell (Fig. 2, #1) comprising planar sheets (Fig. 2, #4) disposed on opposite sides of the printed wiring board, the planar sheets being spaced from each other via at least one of a spacer (Fig. 2, #18) and a connector (Fig. 2, #2 and #6) for electrically connecting the printed wiring board and electronic components with an external circuit (Col. 1, line 33); a thermal filler (Fig. 2, #19) disposed between the shell and at least one of the electronic components; and a lightweight material (Fig. 2, #8, #9 or #15), different in composition from the thermal filler, filling a void between the shell and the printed wiring board and electronic components that is not filled by the thermal filler. Artus does not teach the material of the planar sheets. Bootle teaches the planar sheets of composite material (Col. 1, line 18). Bootle further teaches the composite

material comprises carbon fiber (Col. 1, line 18). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the circuit card assembly of Artus with that of Bootle for the purpose of selecting a shell material which is strong, lightweight and provides electromagnetic shielding.

With respect to Claim 4, Artus further teaches the thermal filler (Fig. 2, #19) provides thermal dissipation (Col. 3, lines 4-6) for the at least one electronic component (Fig. 2, #13).

With respect to Claim 10, Artus teaches the apparatus of claim 7. Artus does not teach the material of the planar sheets. Bootle teaches the planar sheets are comprised of carbon fiber (Col. 1, line 18). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the circuit card assembly of Artus with that of Bootle for the purpose of selecting a s shell material which is strong, lightweight and provides electromagnetic shielding.

With respect to Claim 12, Artus further teaches a method wherein the shell (Fig. 2, #1) comprises planar sheets (Fig. 2, #4) disposed on opposite sides (Fig. 2, #4 on left and right sides) of the printed wiring board, the planar sheets being spaced from each other via at least one of a spacer (Fig. 2, #18) and a connector (Fig. 2, #2 and #6) for electrically connecting the printed wiring board and electronic components with an external circuit. Artus does not teach the material of the planar sheets. Bootle teaches the planar sheets of composite material (Col. 1, line 18). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the circuit

card assembly of Artus with that of Bootle for the purpose of selecting a shell material which is strong, lightweight and provides electromagnetic shielding.

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Artus (US 4,764,845) as applied to claim 1 above, and in view of Scheak (US 5,009;311).

With respect to Claim 2, Artus teaches the circuit card assembly of claim 1. Artus does not teach the lightweight material is made up of expandable foam. Schenk teaches the lightweight material is made up of expandable foam (Col. 2, lines 13-14). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the circuit card assembly of Artus with that of Scheak for the purpose of selecting a material that will assume whatever shape it is allowed by the cavity.

8. Claimd 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Artus (US 4,764,845) as applied to claim 1 above, and in view of Grenet et al. (US 5,293,002).

With respect to Claim 3, Artus teaches the circuit card assembly of claim 1. Artus does not teach the holes in the outer shell for injecting the materials. Grenet et al. teaches at least one of the thermal filler and the lightweight material is injected (Col. 1, line 25) into the outer shell (Fig. 1, #8, #9 and #11) though holes (Fig. 1, #14) in the outer shell. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the circuit card assembly of Artus with that of Grenet for the purpose of having an entrance to inject the filler materials after the circuit card assembly is assembled together.

With respect to Claim 8, Artus teaches the apparatus of claim 7. Artus does not teach the squirt holes in the shell. Grenet et al. teaches wherein at least one of the thermal filler and the lightweight material is injected (Col. 1, line 25) into the shell through squirt holes (Fig. 1, #14) in the shell (Fig. 1, #8, #9 and #11). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the circuit card assembly of Artus with that of Grenet for the purpose of having an entrance to inject the filler materials after the circuit card assembly is assembled together.

9. Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Artus (US 4,764,845) as applied to claim 1 and 7 above, and in view of Patel (US 5,396,403) and Watari (US 4,612,601).

With respect to Claims 5 and 9, Artus teaches the circuit card assembly and the apparatus of claim 1 and 7, respectfully. Artus does not teach the material of the thermal filler. Patel teaches the thermal filler comprises silver-filled silicone. Watari teaches the thermal filler comprises silver-filled epoxy. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the circuit card assembly of Artus with that of Patel or Watari for the purpose of selecting a thermal filler that has good thermal conductivity properties.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sherif et al. (US 5,724,729) teaches a plurality of encapsulates

(Col. 1, lines 51-52, Col. 2, lines 63-66) for thermal conductivity and environmental protection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert J. Hoffberg whose telephone number is (571) 272-2761. The examiner can normally be reached on 8:30 AM - 4:30 PM Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn D. Feild can be reached on (571) 272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RJH

LISA LEA-EDMONDS
PRIMARY EXAMINER